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*Dr. Billings with Dr. Grant's Compl.*

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# THE EPIDEMIC ZYMOTIC DISEASES OF ANIMALS AND HOW THEY ARE COMMUNICATED TO MAN.

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GENTLEMEN,—With your kind permission, I will digress from the usual path in delivering an annual address on the progress of medical science, and confine the few observations I have now to offer to "The Epidemic Zymotic Diseases of Animals, and How they are Communicated to Man." For many years, while directing some little attention to Natural History, I have noted points in pathological anatomy closely allied with the diseased manifestations in the "genus homo," and being a wide field for the practical exercise of pathological research, I felt confident such would not be uninteresting to the members of our Society. The subject is one of vast importance to our common country, inasmuch as it involves millions, in our live stock, irrespective of its scientific aspect. Endemic and epidemic diseases are not alone confined to the human species, but extend alike to animals, and the manifestations are doubtless of peculiar interest. The analogy is so close that they are designated by the same names. Several are propagated in the human organism, and many present pathological information of great importance. The late Dr. Farr, of England,

specified these as diseases which distinguish one country from another, and whose occurrence form epochs in chronology. The exact cause of these diseases, although not positively known, is supposed in the animal organisms to act like a ferment, hence the term "Zymotic." According to the most recent enquiries the generation of "organic germs," originate in the individual, or by fermentation in the diseased excretions of the organism, and thus transmitted through various media from body to body, at sensible and insensible distances.

It is a well recognized fact that the death rate, in almost every country, from such sources of disease, is very considerable. The result of literally packing animals together, which can doubtless be scarcely avoided, as in the trains of our various railroads, cannot escape the attention of the most ordinary observer. The atmospheric signal is perfect in its way. Thus infection rapidly spreads, where diseased germs exist, and the consequences are frequently most serious. According to Prof. Law, since 1842, England has lost over 450 millions of dollars through the contagion of cattle imported from the Continent. The stamping out process by slaughtering all the diseased cattle, and thorough disinfection afterwards, and the exclusion of all diseased animals from the country, has been productive of the best results. Diseased germs are doubtless the very foundation of the diseases of animals, and the early recognition of incipient development is of vast importance. Diseases in animals are divided into two classes: the *Exotic* or *uncommon*, and the *indigenous* or *common*. Of the first class, we have *small-pox in sheep and birds*, Pleuro-pneumonia of cattle, Rinderpest, Malignant diseases of the generative organs of the horse kind, Malignant cholera of animals, Aphthous fever, known as foot and mouth disease. Of the second class, or indigenous diseases, belong Glanders, Rabies, Contagious foot rot, Tuberculosis, Malignant Anthrax, Hog cholera, or intestinal fever of swine, Influenza, Strangles, Canine distemper, and Horse pox, seen in the cow, goat, and pig. In each of these diseases there is a zymotic influence at work, precisely as in the development of disease in our own species. Hippocrates, in his time, enunciated clearly the influence of impurity in air, soil or water, as factors in the development of disease zymotic in character. The impurity of soil has much to do with the production of disease, in both milk and meat, thus influencing the human family and spreading the germs of disease of a most serious character. The death rate in man and animal, from foul stock yards,



and filthy alleys in towns and cities, is much greater than the public are aware of. Disease may remain endemic, or spread by animal transportation, hence the vast importance of strict cleanliness and quarantine measures, so as, if possible, to *stamp out* individual cases. The chief epidemic which has occasionally influenced Canadian cattle-trade is pleuro-pneumonia, and the rapidity with which such has been checked, through isolation and disinfection, is creditable to the agricultural departments in the Local and General Governments. Until recently there has been greater attention bestowed upon the arrest of disease in animals than in man, as far as Governments were concerned. Happily now, however, matters are undergoing a change, and sanitary legislation is attracting a greater degree of attention from the powers that be.

"The Contagious Pneumonia of Cattle" has been noted several times in Canada, although not to any great extent. It has on several occasions been introduced into the United States, by the importation of foreign stock. In order to avoid any such dissemination of disease, a most careful system of quarantine is now adopted by the Canadian authorities. The period of latency of the poison of pleuro-pneumonia in the system, is from two to six weeks, at which time it is developed with all the well-defined symptoms of pneumonia. The death rate averages between 50 and 60 per cent. In this disease the poison is exceedingly subtle, virulent and most readily communicated. I have more than once noted epidemic pneumonia in the inhabitants of this district, most rapid in character, and arrested with considerable difficulty. Treatment in either case can only be undertaken with thorough seclusion and disinfection. The early recognition of this disease is important, in order that animals thus affected should not be slaughtered for sale.

Rinderpest, or Russian Cattle Plague, is a most contagious disease amongst animals of the same species. Its chief characteristic is the manner in which the mucous membranes assume a congested state, involving also the lining membrane of the stomach and bowels, associated with a high temperature and extensive desquamation of both skin and mucous membrane. So far, little indeed is known of this disease in Canada, the protection against which is strict quarantine and destruction of the infected animals.

Foot and mouth disease, or *Apthous Fever*, is a species of contagious eruptive disease, confined chiefly to cloven-footed animals, and has been known to extend to man. This disease is usually ushered

in by a rise in temperature and a general feeling of discomfort, and within a day or two is followed by large blisters on the mucous membrane of the mouth, tongue, fauces, udders, and the parts in and about the clefts of the hoofs. It has been known to follow armies, and is said to be exceedingly communicable. The contagious disease is spread much more by contact than by the atmosphere. Milk from such diseased animals is often carried to individuals, the infant most frequently coming in for its share of the diseased influence. Soreness and otherwise unaccountable lameness in cattle, is a most significant indication, when associated with an aphthous state of either the tongue or fauces. Thorough disinfection is here also necessary, and ablution with carbolic acid lotion, with isolation for 10 or 15 days after the disappearance of the disease.

A case is recently recorded in a German veterinary journal, where a veterinary surgeon contracted foot and mouth disease from a pocket-handkerchief he had used while examining beasts suffering from this disease. The next day he was seized with a violent headache and pains in his limbs, high fever and a feeling of irritation in his hands and feet. On the third day the fever subsided, and there appeared an eruption of an aphthous character on the tongue, lips, mouth, and edge of the nose. After eight days the various symptoms subsided without any serious consequences.

Epizoo, or epizooty, otherwise known as influenza or horse epidemic, has prevailed to a considerable extent on both sides of the Atlantic, extending at the same time to man and beast. In 1881 quite a severe epidemic of that character was experienced in various parts of Canada, and many fine animals fell victims to the subsequent pneumonic action which frequently followed. Such epidemics are not of frequent occurrence. The exact cause, although attributed to atmospheric, electrical and other agencies, is still a matter of considerable doubt. So far the two freest portions of Canada from this disease, and chiefly owing to their sequestered character, are Prince Edward Island and Vancouver Island. Absolute quarantine, across large bodies of water, is said to be one of the best means of preventing the spread of this disease.

*Intestinal Fever of Swine*, misnamed *Hog Cholera*, is a disease which, to a moderate extent, has visited this neighborhood during the present season, and several fine animals have fallen victims to its influence. According to Prof. Law, "this disease is attended by con-



gestion, exudation, blood extravasations in the mucous membrane of the stomach and bowels, by general heat, and redness of the surface, and by the appearance on the skin of spots and patches of a scarlet, purple, or black color. The animals had not been dead over ten or twelve hours when the whole mucous and muscular coats of the large intestines became black, and easily lacerated from incipient mortification." The chief cause of this disease, is supposed to be *swill stuff* of breweries and distilleries fed to these animals, crowded together in a crowded space, and an exceedingly impure atmosphere. It is said to be infectious, and spreads rapidly from animal to animal. Much good could be accomplished by the most thorough investigation of this disease.

Pork, in its various forms, as an article of diet, is in very general use, thus the diseases of the hog play an important part in relation to public health. Parasites, although not zymotic in character, infest the flesh of this animal, are exceedingly important, inasmuch as they frequently produce very serious disturbances of the system. The parasites are the *Trichina Spiralis*, the *Cysticercus Cellulose*, and the *Echinococcus*. Very few cases of Trichinosis have, so far, been noted in the Dominion, and up to the present, only number sixteen. We are more fortunate than in Germany, where epidemics from this cause are of frequent occurrence, chiefly owing to some forms of sausages largely used by the masses in a partially cooked condition. Trichinæ, as a rule, are killed by perfect cooking, the safest plan by far, when this form of meat is used. Measley pork contains the immature form of one of the *tapeworms of man*, which originates in the parasite known as the *Cysticercus Cellulosæ*. This condition of pork is frequently seen in our markets, but it is not as serious in its consequences as trichina. The two most frequent forms of tapeworm in Canada are the *Tænia Solium* and *Tænia Saginata*—the former from measley pork, and the latter from measley veal or beef. Tapeworm from beef is generally the result of partial cooking, just as in the case of pork. Raw material in either instance favors the life of the parasite, and hence the subsequent trouble.

The appearance of *Echinococcus* disease in man is, according to present records, exceedingly rare in Canada, as up to the present time only 8 or 10 cases are known. The liver with these cysts is unfit for food; not, however, the flesh, from which they may be removed when not numerous, and the carcass be still fit for use as food.

Glanders, or Farcy, requires more than a passing notice from its importance, and the fact of its fatality when communicated to man from the horse, marking *its contagious febrile character*. Its chief specific peculiarities are inflammatory lesions of the *nasal* and *respiratory* mucous membranes, lymphatic vessels and glands, marked constitutional depression, and frequently accompanied with a pustular cutaneous eruption. Glanders and Farcy are really one and the same disease, the affection of the respiratory mucous membrane is followed by implication of the lymphatics. Glanders in man is very rare. Last July a case was recorded in the Montreal general hospital, under Dr. Geo. Ross, which was well defined, and terminated fatally. So far we have no positive case originating in man, and it is always communicated by direct inoculation of virus from the diseased animal. It is somewhat common with horses, and is known to spread rapidly, and, by some, it is maintained that it possesses "a volatile infecting principle," the period of incubation varying from three to eight days, and sometimes even to three weeks. The longer the incubation, the less acute the disease, as a rule. Its symptoms, as a whole, frequently simulate acute rheumatism. Some cases have ended fatally in one week, but, in the usual acute form, the average duration is about sixteen days, but, occasionally it will be protracted for several weeks, and even months, under which circumstances the prospect of recovery is favorable. The wound through which the poison is admitted becomes inflamed, tense, painful, and usually has an erysipelatous circumference. The ulcer enlarges, presents a chancroid aspect, discharging sanious, offensive matter, and the lymphatic vessels around present a knotted, cord-like, irregularly, nodulated condition, known in man as the *farcy buds*. According to Virchow, resolution and absorption occasionally take place, but more frequently deep-seated abscesses form, and constitutional symptoms, indicating a low type. Within the first or second day of this disease (and sometimes longer) scattered collections of red spots appear on the skin, small, and resembling flea bites, subsequently they become papular, and elevated above the skin like small shot, and assume a yellow color. They are considered as due to the deposit of some neoplastic material, which gradually softens and becomes disintegrated. They subsequently become vesicular, or sero-purulent with inflamed bases. Otherwise, various modifications of character have been noted, of minor importance. The mucous membranes, particularly that of the nose, become affected, and, in fact, sub-



ject to specific inflammation and ulceration. Both in man and horse, the disease is supposed to originate by the application of the virus to the nose mucous membrane. The disease is liable to extend to the bronchial and pulmonary tissues generally. Rheumatism, typhoid fever, pyæmia, syphilis, and tuberculosis have all been mistaken for glanders. Thorough disinfection—isolation—destruction of stalls and harness, are all necessary to arrest the disease. So far, recorded cases point out that recoveries from this malady are rare, particularly in the acute form. The pre-eminently debilitating character of this disease indicates a stimulating, soothing, and supporting treatment. Inhalation of iodine and carbolic acid are strongly recommended, and thorough syringing of the nose with Condy's fluid, (solution) carbolic acid lotion, or iodised water, all of which have been found productive of beneficial results.

Dr. Kitt, of Berlin, has recently examined the material taken from a "farcy bud" after the hair had been carefully shaved off, and the skin thoroughly washed with mercuric chloride. The contents of the bud brought in contact with blood serum, and on the 3rd or 4th day, isolated yellow points appeared, which soon increased in size, that on examination and most careful experiment, proved to be true glanders bacilli. These bacilli are somewhat smaller than those of tuberculosis, but are a little thicker and color easily in methylviolet. Rabbits, inoculated with pure cultivations of these bacilli, produced beyond a doubt, nasal and pulmonary glanders, demonstrated by subsequent microscopical examination.

There are various other forms of diseases which attack man and beast much in the same manner, such as cerebro-spinal meningitis, known as blind staggers, anthrax, and tuberculosis. As time, however, will not admit of particulars on these various subjects, I shall now offer a few notes on tuberculosis, as this disease is one attracting very great interest. Dr. Bell, the able editor of the *Sanitarian* (N. Y.) 1877 August, published an article on "Tuberculosis in milch cows, and the Contagiousness of Tuberculosis by the Digestive Organs." He states, that according to various experiments performed in Germany and other parts, tuberculosis may be induced in various domestic animals by feeding them with tubercular matter, with flesh of tuberculous animals, and even with the milk of tuberculous cows, and he concludes by the very cogent question: may not the like effects result from the use of such food in the human species? Through the kindness of an offal contractor

in Brooklyn, he made various post mortem examinations of cows, and in several instances demonstrated beyond a doubt, the existence of tuberculosis of the lungs in these animals. He states that the milk of cows affected with that disease is likely to induce tuberculosis in the child, and usually commencing as intestinal catarrh.

The recent observations of Mr. Heard, M.R.C.V.S., of New Port, demonstrate that the bacillus tuberculosis of man is the same as the bacillus tuberculosis of bovines. The cultivated tuberculosis of man, when introduced into cattle by inoculation, results in tuberculosis.

Milk from tuberculous animals does not contain the bacillus tuberculosis, and cannot produce the disease unless the udder itself is the seat of tuberculosis, which is frequently the case. There are many recorded cases which prove that tuberculosis is a very infectious disease, transmissible from man to man and from animal to man. Fully one-seventh of the human family death rate, is from tuberculosis, hence the vast importance of the most careful enquiry as to all circumstances connected with the development of this disease.

Typhoid fever is well known to be promoted by impure milk, as in the epidemic pointed out by Dr. Ballard, of Islington. The subject is one deserving of every consideration, and in the hands of the physician, much good may be accomplished by actively directed endeavors, and much practical benefit will doubtless spring from the wide-spread thoughtfulness now to be observed in various parts of the Dominion, as to the necessity and value of hygienic measures. According to Dr. Bowditch, there are more than "two hundred thousand human beings slaughtered annually in the United States by preventable diseases." May we not ask what is the death rate from such in Canada? The climate of Canada is certainly conducive to health, still there is ample room for the exercise of sanitary measures in order to stamp out such epidemics as greatly increase the death rate, and bring ruin to once flourishing commercial interests.

As to diseases in animals, the members of our profession hold great power in their own hands. We have observed how disease may spread from the lower species to the human family, and engender trouble and suffering, much of which, through careful observation and moderate direction, might be obviated. The English and French schools of the past, as well as the present, have worked nobly with a benevolent and philanthropic object in view, giving such light to

science and the world as the people of our age enjoy. What illustrious names have we in John Hunter, Jenner, Bichat, Corvisart, Audral, Louis, Pasteur, Koch, and Sanderson, whose labors in comparative pathology have formed the very basis of modern thought, in both physiology and morbid anatomy. Buckle says, that "between Bichat and Aristotle 'I know no middle man.'" As for Hunter, like the meteoric light, his intellectual power flashed as the product of his century, and he certainly possessed a rare genius which could not fail to impress the age in which he flourished.

From the various facts coming under our observation as to the spread of disease, does it not appear reasonable there should be some degree of inspection as to both milk and meat, by the proper sanitary authorities, in order to guard more thoroughly the public interest. In Germany such is most rigidly carried into operation, and no meat is offered for sale until first reported upon in the *abattoir* by the scientific pathologist, and thus a good work is accomplished.

In conclusion let me say, I hold it to be the duty of every member of the profession in our city to connect himself with our society, to attend its meetings as often as practicable, and to contribute each year a few facts, at least, to our transactions. Thus our profession affords ample scope for the exercise of individuality. No one man knows all minds, and delicate shadings of disease, which may escape one individual, may be grasped by another, and thus we are enabled to reciprocate nature's power, and place on record the daily observations of life's duty. Practitioners in rural districts, contrasting their opportunities with the larger sphere of hospital city work, may erroneously conclude that no new discovery can possibly be made in such a line of thought and practice. A single fact, however humble, is a valuable contribution to science, and such may as well be observed in country as city. What a blessing it would be if some rural practitioner could possibly define the exact cause of diphtheritic epidemics of recent origin at Chelsea, Ironsides, and Montebello. Pure air, fresh water, and nourishing diet in abundance, and yet this dire disease and its marked fatality. The death rate in the Gatineau country within the past few years from this disease, has certainly been very great.

There are difficulties to contend against in our profession, not greater, however, than in the performance of any work, worthy of our very best efforts. Our number in this city is not great, and there is an



earnestness of work of a most commendable character. A few remain in a measure, outside our medical gatherings, the loss being truly theirs. The sympathetic power which unites us, assists in the development of intellectual activity and vigor. Years are rapidly passing on, and the connecting link will sever. We have the pleasing gratification of knowing that our efforts have not been altogether unsuccessful. Genius will raise one man in a million above his fellows. But, after all, "genius is an infinite capacity for taking pains."

Whatever the advantages may be, whether at the rural fireside or the city hospital, there are rare opportunities of doing good. Let the work be carefully and conscientiously performed, with painstaking application, and, rely upon it, the reward will come. Thanking you in an especial manner for my reappointment to the presidency of the society for the coming year, let me invite your hearty co-operation in the noble work placed in our hands.









